CLAIMS

Please amend the claims as follows, cancel claim 14 without prejudice and enter new claims 38-45.

1. (Currently amended) A method for treating a working surface of a quartz semiconductor manufacturing substrate comprising:

preparing a quartz semiconductor manufacturing substrate to provide [[a]]said working surface having an initial working surface roughness; and

ultrasonically acid-etching said working surface to increase [[the]]said initial working surface roughness of said working surface by at least about 10% but less than that which would create cracks under said working surface which could result in pieces disengaging from said working surface.

2. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 1 wherein ~~preparing a quartz substrate includes obtaining a quartz substrate having an~~said initial working surface roughness is greater than about 10 Ra.

3. (Original) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 2 wherein ~~preparing a quartz substrate includes obtaining a quartz substrate having an~~said initial working surface roughness [[of]]is about 16 Ra.

4. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 2

wherein preparing [[a]]said quartz semiconductor manufacturing substrate includes roughening said initial working surface roughness to a roughness greater than about 100 Ra by coarse grit blasting said working surface with a grit having mesh size no greater than about 100.

5. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 4 wherein said roughening roughens said initial working surface roughness to a roughness greater than about 300 Ra.

6. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 1 wherein ultrasonically acid-etching increases [[the]]said initial working surface roughness by at least about 25%.

7. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 1 wherein ultrasonically acid-etching increases said working surface roughness by at least about 50%.

8. (Currently amended) A method for treating a working surface of a quartz semiconductor manufacturing substrate ~~as recited in claim 1 further~~ comprising:

preparing a quartz semiconductor manufacturing substrate to provide a working surface having an initial working surface roughness;

ultrasonically acid-etching said working surface to increase said initial working surface roughness of said working surface by at least about 10%; and

grit blasting said working surface after ultrasonically acid-etch[[c]]ing said working surface with a fine grit having a mesh size greater than about 100.

9. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 8 wherein said fine grit has a mesh size greater than about 200.

10. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 8 wherein said acid-etching is a first acid-etching and further comprising a second acid-etching of said working surface after fine grit blasting said working surface.

11. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 10 wherein said first acid-etching removes substantially more material from said working surface than said second acid-etching.

12. (Currently amended) A method for treating a working surface of a quartz semiconductor manufacturing substrate, said method comprising:

ultrasonically acid-etching [[a]]said quartz semiconductor manufacturing substrate to substantially remove one or more cracks in [[a]]said working surface of said substrate; and

subjecting said ~~substrate~~working surface to a final cleaning process which prepares said quartz semiconductor manufacturing substrate for use wherein said final cleaning process includes:

a) soaking said substrate for about 10-30 minutes in an acidic solution consisting of $HF:HNO_3:H_2O$ or spraying said substrate with an acidic solution comprising $HF:H_2O_2:HNO_3$;

b) rinsing said substrate with deionized water for about 5-15 minutes at about 20-50°C.;

c) ultrasonicating said substrate in an ultrasonication deionized water bath for about 30 minutes at about 38-46°C.;

d) drying said substrate with nitrogen to remove excess moisture; and

e) heating said substrate under a heat lamp or in an oven.

13. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 12 further comprising:

coarse grit blasting said working surface prior to ultrasonically acid-etching to produce a roughened surface having an average surface roughness (Ra) of between about 100 and about 400 Ra.

14. (Canceled)

15. (Currently amended) A method for treating [[a]]said working surface of [[a]]said quartz semiconductor manufacturing substrate as recited in claim 12 further comprising:

micro-roughening said working surface of said quartz manufacturing substrate prior to said final cleaning process by:

(a) positioning a pressurized grit expulsion nozzle a predetermined distance from, and at an angle less than about 60° to, said ~~substrate~~working surface; and

(b) ejecting grit from said nozzle against said working surface at a velocity sufficient to produce a micro-roughened surface.

Claims 16-37 (Canceled)

38. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 8 wherein said initial working surface roughness is greater than about 10 Ra.

39. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 38 wherein said initial working surface roughness is about 16 Ra.

40. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 38 wherein preparing said quartz semiconductor manufacturing substrate includes roughening said initial working

surface roughness to a roughness greater than about 100 Ra by coarse grit blasting said working surface with a grit having mesh size no greater than about 100.

41. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 40 wherein said roughening roughens said initial working surface roughness to a roughness greater than about 300 Ra.

42. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 38 wherein ultrasonically acid-etching increases said initial working surface roughness by at least about 25%.

43. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 38 wherein ultrasonically acid-etching increases said initial working surface roughness by at least about 50%.

44. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate as recited in claim 1 wherein an acidic solution used for acid etching consists of equal parts of hydrofluoric acid, nitric acid and hydrogen peroxide.

45. (New) A method for treating a working surface of a quartz semiconductor manufacturing substrate comprising:

preparing a quartz semiconductor manufacturing substrate to provide said working surface having an initial working surface roughness; and

ultrasonically acid-etching said working surface to increase said initial working surface roughness of said working surface by at least about 10% wherein said working surface is ultrasonically etched at a frequency of at least about 18 kilohertz.